Goddard Procedural Requirements (GPR)

DIRECTIVE NO.	GPR 1820.2B	**APPROVED BY Signature:**	*Original Signed By*
EFFECTIVE DATE:	March 23, 2015	**NAME:**	Judith N. Bruner
EXPIRATION DATE:	March 23, 2020	**TITLE:**	Director, Safety and Mission Assurance

COMPLIANCE IS MANDATORY

Responsible Office: 360/Safety Division

Title: Respiratory Protection Program

PREFACE

P.1 PURPOSE

This directive defines the requirements of the Respiratory Protection Program at the Goddard Space Flight Center (GSFC). The Program's purpose is to prevent respiratory system illness that may result from breathing workplace air contaminated with dusts, fumes, mists, smokes, gases, or vapors.

P.2 APPLICABILITY

This directive applies to all GSFC civil service employees. GSFC contractors, tenant organizations, grantees, clubs, and other organizations operating under the auspices of GSFC, or on GSFC property, shall administer their own respiratory protection programs that meet the requirements of NPR 1800.1 and Section 2 of this GPR.

P.3 AUTHORITY

a. NPD 1800.2, NASA Occupational Health Program; and
b. NPR 1800.1, NASA Occupational Health Program Procedures.

P.4 APPLICABLE DOCUMENTS

a. 29 Code of Federal Regulations (CFR) 1904.10, OSHA, Recording and Reporting Occupational Injuries and Illness;
b. 29 CFR 1910.134, Occupational Safety and Health Administration (OSHA), Respiratory Protection;
c. 29 CFR 1910.1000, OSHA, Air Contaminants;
d. 42 CFR 84, National Institute of Occupational Safety and Health (NIOSH), Approval of Respiratory Protective Devices;
e. 49 CFR 173, Department of Transportation, Shippers – General Requirements for Shipments and Packaging;
f. 49 CFR 178, Department of Transportation, Specifications for Packaging;
g. GPR 1700.2, Chemical Hygiene Program;
h. GPR 1840.2, Industrial Hygiene Program;
i. GPR 8621.4, GSFC Mishap Preparedness and Contingency Plan;
j. GPR 8710.2, Emergency Preparedness Program Plan for Greenbelt;

k. GPR 8715.6, WFF Safety, Occupational Health, and Emergency Preparedness Programs;
l. GSFC Form 17-26, Exit Clearance Record;
m. GSFC Form 17-26W, Exit Clearance Record/Wallops;
n. GSFC Form 23-60, Task Safety Analysis;
o. Form 350-PPE-0001, Respirator Voluntary Use Agreement;
p. American Conference of Governmental Industrial Hygienists (ACGIH) TLVs® and BEIs®;
q. American National Standards Institute (ANSI) Standard Z88.6-2006 Respiratory Protection - Respirator Use - Physical Qualifications for Personnel;
r. ANSI Standard Z88.7-2010 Color Coding of Air-Purifying Respirator Canisters, Cartridges and Filters;
s. ANSI Standard Z88.10-2010 Respirator Fit Test Methods;
t. American Thoracic Society (ATS)/European Respiratory Society (ERS) Standardization of Lung Function Testing: General Considerations for Lung Function Testing;
u. Compressed Gas Association, Commodity Specification for Air, G-7.1-2011; and
v. NIOSH Pocket Guide to Chemical Hazards.

P.5 CANCELLATION

GPR 1820.2A, Respiratory Protection Program

P.6 SAFETY

All personnel who perform surveys in conjunction with this document shall comply with all worksite safety and health requirements.

P.7 TRAINING

a. Employees enrolled in the Respiratory Protection Program shall receive training to include the elements in Section 2.6.

b. Personnel who provide respirator training and fit-testing shall:
(1) Have demonstrated competence in respiratory protection and be knowledgeable in the application and use of respirators, as well as their limitations;
(2) Have practical knowledge in the selection and use of respirators and work practices at the site;
(3) Be knowledgeable in the contents of this GPR and applicable regulations including the OSHA Respiratory Protection standard; and
(4) Provide respirator fit-testing in accordance with ANSI Z88.10-2010 or OSHA 29 CFR 1910.134.

c. Personnel who administer lung function testing as part of medical evaluations shall have demonstrated competence in operating and calibrating the spirometer through training provided by the Health Unit, and be or act under the supervision of a licensed health care practitioner. The Health Unit will provide training with consideration to ANSI Z88.6-2006 and ATS/ERS Standardization of Lung Function Testing: General Considerations for Lung Function Testing.

P.8 RECORDS

Record Title	Record Custodian	Retention
Employee Lung Function Tests and Medical Evaluations	Medical and Environmental Management Division (MEMD), Health Unit (Greenbelt or WFF)	*NRRS 1/127A1(b) Thirty days after separation, transfer to National Personnel Records Center (NPRC), St. Louis, MO. NPRC will destroy 75 years after birth date, 60 years after date of the earliest document in the folder if the date of birth cannot be ascertained, or 30 years after latest separation, whichever is later.
Spirometer Calibrations	MEMD, Health Unit (Greenbelt or WFF)	*NRRS 8/41.5B. Cut off upon audit, analysis or quality check. Delete 5 years after cut-off.
Employee Personal Air Monitoring Results	Safety Division, Industrial Hygiene Office (IHO)	*NRRS 1/127A1(b).
Employee Fit-Testing Results	Safety Division, IHO	*NRRS 1/127A1(b).
Area Air Monitoring Results and Reports	Safety Division, IHO	*NRRS 1/124 Retire to Federal Records Center (FRC) when 3 years old. Destroy when 10 years old.
Training Records of Respiratory Protection Program Participants	Office of Human Capital Management	*NRRS 3/33G1. Destroy 5 years after employee discontinues or completes training.
Calibration Certificates of Air Monitoring and Fit-Testing Instrumentation	Safety Division, IHO	* NRRS 8/41.5B.
Respiratory Protection Program Removal Letter	Safety Division, IHO	*NRRS 1/127A1(b).
Form 350-PPE-0001, Respirator Voluntary Use Agreement	Safety Division, IHO	*NRRS 1/127A1(b).

**NRRS – NASA Records Retention Schedules (NPR 1441.1)*

P.9 MEASUREMENT/VERIFICATION

The civil service Industrial Hygienist will maintain metrics on the performance of the Respiratory Protection Program. The metrics are compiled, reviewed, and reported at least annually to the Safety Division Chief. These metrics may include, but are not limited to:

a. Number of employees enrolled in the Respiratory Protection Program that have a current medical clearance, and have received annual fit-testing and respiratory protection training in relation to the number of employees enrolled in the Respiratory Protection Program;

b. Number of employees newly identified for enrollment and number of employees removed from the Program;

c. Number of employees enrolled in the Program who have received medical evaluations, annual fit-testing, and training within 1 month of their due date in relation to the number of employees enrolled in the Program;

d. Among employees enrolled in the Program, number of medical evaluations or lung function tests indicating respiratory obstruction or malfunction, such that clearance was not authorized;

e. Number of instances in which engineering controls, administrative controls, and respiratory protection were implemented in relation to the number of instances such controls were recommended due to potentially hazardous airborne contaminants; and

f. Percentage of training evaluation questionnaires with above average to excellent ratings or poor ratings in relation to the total number of evaluation questionnaires returned.

PROCEDURES

In this document, a requirement is identified by "shall," a good practice by "should," permission by "may" or "can," expectation by "will," and descriptive material by "is."

1. RESPONSIBILITIES

1.1 The Center Director shall ensure:

a. A safe and healthful workplace is provided for all GSFC personnel; and

b. All recognized inhalation hazards are controlled to the greatest possible extent.

1.2 The Safety Division IHO shall:

a. Administer, evaluate, and review the GSFC Respiratory Protection Program to ensure compliance with NPR 1800.1 and NPD 1800.2;

b. Identify civil service employees and contractors required to participate in a respiratory protection program, per OSHA 29 CFR 1910.134, through quantitative and qualitative exposure assessments, and during health hazard evaluations and industrial hygiene (IH) surveys conducted in accordance with GPR 1840.2;

c. Notify civil service employees by letter or by email of their enrollment status in the GSFC Respiratory Protection Program when exposure exceeds the action level or occupational exposure limit (OEL) for a chemical substance;

d. Notify supervisors and other affected employees or responsible safety organizations of Respiratory Protection Program requirements following qualitative or quantitative exposure assessment indicating potential exposure levels equaling or exceeding the action level for a chemical substance;

e. Provide guidance to personnel regarding exposure to hazardous airborne concentrations of chemical substances, and recommend types of respiratory protection;

f. Provide annual respiratory protection training to civil service employees enrolled in the Program, and supervisors as requested;

g. Provide annual respirator fit-testing to civil service employees enrolled in the Program;

h. Provide Appendix D of the OSHA Respiratory Protection Standard 29 CFR 1910.134 to civil service employees designated as voluntary users of respirators, and maintain copies signed by the employee and supervisor;

i. Provide the Health Unit (Greenbelt or WFF as appropriate) with an updated list or database of employees enrolled in the Program and maintain archived lists indicating dates of medical evaluation, training and fit-testing;

j. Perform follow-up exposure assessments on referral from the MEMD Health Unit (Greenbelt or WFF);

k. Remove employees from the Respiratory Protection Program who are determined not to be required to wear respirators;

l. Inform the Health Unit of any employee removed from the Respiratory Protection Program and of any employee designated as a voluntary user;

m. Inform Respiratory Protection Program enrollees, and their supervisors, who have not met the requirements of the Program that they shall not be permitted to perform work activities associated with respirator use;

n. Ensure that instrumentation used for fit-testing is properly calibrated or within its current calibration period;

o. Provide periodic Respiratory Protection Program status reports to the IH Services COR.

1.3 The WFF Safety Office shall:

Accomplish the IH responsibilities in Section 1.2 for WFF, except where otherwise stated.

1.4 The MEMD Health Unit (Greenbelt and WFF) shall:

a. Provide medical evaluations in accordance with GPR 1800.2, 29 CFR 1910.134, and Section 2.4 of this GPR to determine whether civil service employees enrolled in the GSFC Respiratory Protection Program and civil service employees designated as voluntary users of elastomeric respirators are fit to wear respirators;

b. Contact employees enrolled in the Respiratory Protection Program and employees designated as voluntary users of elastomeric respirators to schedule required medical evaluations;

c. Provide medical evaluations that include medical and work history, with emphasis on past and present air contaminant exposure;

d. Provide medical clearance for respirator use;

e. Provide written notification of medical evaluation results to the employee, and explain the need for further testing and/or referral;

f. Perform a retest if an employee fails a lung function test as a result of a temporary illness;

g. Provide written notification to both employee and supervisor within 30 days of receiving confirmation that an employee is not fit to wear a respirator;

h. Inform the IHO after each medical evaluation for respirator use whether or not that employee was medically cleared;

i. Inform the IHO regarding any employee who has sustained a chronic respiratory illness or acute exposure to an extremely toxic substance to facilitate a subsequent IHO evaluation of the workplace and employee work practices, and possible recommendation for reassignment if control measures are not achievable.

j. Maintain medical evaluation records and other information pertinent to the medical surveillance requirements;

k. Ensure that health care professionals performing lung function testing are qualified and knowledgeable in operating the testing equipment and function under the supervision of a physician or licensed health care professional;

l. Ensure the proper functioning and calibration of the lung function testing equipment in accordance with manufacturer specifications; and

m. Maintain lung function testing equipment calibration records.

1.5 The Office of Human Capital Management shall:

Ensure that civil service employees complete GSFC Form 17-26 or 17-26W, Exit Clearance Record, prior to termination of employment. GSFC Form 17-26 and 17-26W require an exit medical clearance from the Health Unit (Greenbelt or Wallops) if the employee indicates workplace exposure to asbestos, arsenic, beryllium, cadmium, ethylene oxide, formaldehyde, methylene chloride, or other toxic chemical with an OSHA substance specific health standard.

1.6 The Safety Division Mishap Program Manager or WFF Mishap Program Manager shall:

Record all illnesses having an etiologic relation to workplace inhalation hazards in the Incident Reporting Information System (IRIS) for OSHA 300 log reporting purposes in accordance with GPR 8621.4.

1.7 Supervisors and Managers shall:

a. Notify the Safety Division IHO of any civil service employees potentially required to wear respirators, and any workplace conditions in which personnel are potentially exposed to hazardous concentrations of airborne contaminants. Notification shall be given before or as soon as these conditions are recognized;

b. Complete job hazard analyses (JHAs) using GSFC Form 23-60, or process hazard analyses (PHAs) per GPR 1700.2 as a tool for identifying operations that may result in hazardous atmospheres or hazardous airborne chemical concentration levels;

c. Notify the contractor's safety representative and COR of any activities potentially requiring personnel to wear respirators;

d. Ensure that their respective personnel are provided with and wear NIOSH-approved respirators prior to operations in which they are exposed to airborne chemical levels potentially equaling or exceeding the action level or OEL;

e. Ensure that their respective personnel who participate in a respiratory protection program complete the required annual training and fit-testing;

f. Ensure that their respective personnel enrolled in a respiratory protection program or designated as voluntary users receive baseline and periodic medical evaluations;

g. Implement engineering controls, substitution of chemicals, administrative controls, reassignment of duties, and respirator use in order to control personnel exposure to airborne chemical substances;

h. Refer their respective personnel who complain of respiratory illness to the Health Unit or other health care provider;

i. Ensure that their respective personnel who wear tight-fitting respirators perform a user seal check each time they put on the respirator using the procedures in OSHA 29 CFR 1910.134 Appendix B-1 or procedures recommended by the respirator manufacturer that are as effective as those in OSHA 29 CFR 1910.134 Appendix B-1;

j. Cooperate with the IHO in reassigning enrolled Respiratory Protection Program civil service employees who have not completed the requirements of this directive to positions in which respirators are not required or recommended until such time that these employees come into compliance;

k. Co-sign Appendix D of the OSHA Respiratory Protection Standard 29 CFR 1910.134 with any civil service employee designated as a voluntary user of respirators;

l. Remove from service respirators of their respective personnel who have not completed the requirements of this directive;

m. Ensure that their respective personnel who have facial hair or any other condition that interferes with the face-to-facepiece seal or valve function shave or rectify interference with the seal prior to wearing tight-fitting respirators;

n. Notify the IHO prior to any changes in operations that introduce potentially hazardous chemicals, and provide lists of affected personnel;

o. Ensure that engineering and administrative controls recommended by the IHO are designed and implemented to reduce chemical exposures to below the action level and OEL, or to the maximum extent feasible;

p. Report new cases of work-related respiratory illnesses to the Mishap Program Manager;

q. Ensure that illnesses of their respective personnel, which may have an etiologic relation to workplace atmospheres, are recorded and maintained on their organizations' OSHA 300 logs; and

r. Ensure that an exit medical clearance is completed for civil service employees upon termination of employment (GSFC Form 17-26 or 17-26W, Exit Clearance Record).

1.8 CORs shall:

Notify the IHO of any contractor operations suspected of generating hazardous air contaminant concentration levels.

1.9 Employees shall:

a. Refrain from wearing respirators until all requirements in this directive, including receiving periodic medical evaluation, and annual respiratory protection training and fit-testing have been completed;

b. Cooperate with supervisors, the IHO, and the Health Unit in activities undertaken to evaluate exposure to hazardous air contaminants;

c. Notify supervisors of areas, operations, or equipment that may generate hazardous air contaminant levels; and

d. Have the right to decline participation in the Respiratory Protection Program; however, such a declination may result in exclusion from performing certain work functions.

1.10 Employees Enrolled in the Respiratory Protection Program shall:

a. Wear respirators in accordance with this directive and as required by supervisors;

b. Complete all requirements in this directive, including receiving periodic medical evaluation, and annual respiratory protection training and fit-testing;

c. Ensure that medical evaluations and lung function tests conducted by a private medical provider are provided to the GSFC Health Unit (Greenbelt or WFF);

d. Have the right to obtain medical evaluations from a private medical provider at their own cost;

e. Wear only those respirators for which they have been authorized, trained, and fit-tested;

f. Store and maintain respirators in a functional and sanitary condition;

g. Inspect their respirators before each use for worn, degraded, and nonfunctioning parts, and take out of service those respirators that are damaged or not functional;

h. Leave the work area if vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece is detected, and until such time that the respirator is replaced or repaired;

i. Perform a seal check each time a tight-fitting respirator is worn using the procedures in Appendix B of OSHA 29 CFR 1910.134 or procedures recommended by the respirator manufacturer that are as effective as those in OSHA 29 CFR 1910.134;

j. Have no beard or facial hair growth that may interfere with the face-to-facepiece seal during respirator use;

k. Notify the IHO so that fit-testing can be conducted if weight loss, cosmetic surgery, or other condition has occurred since the most recent annual fit-test; and

l. Ensure that an exit medical clearance is obtained upon termination of employment (GSFC Form 17-26 or 17-26W, Exit Clearance Record).

1.11 Employees Designated as Voluntary Users of Respirators shall:

a. Wear only those respirators that they have been authorized for voluntary use, and wear respirators in accordance with this directive, specifically section 2.7;

b. Receive periodic medical evaluations to determine fitness to wear a respirator if the respirator to be worn is a tight-fitting elastomeric air purifying respirator (period determined by the Health Unit);

c. Have the right to obtain medical evaluations at their own cost from a private medical provider;

d. Ensure that medical evaluations and lung function tests conducted by a private medical provider are provided to the GSFC Health Unit (Greenbelt or WFF) if the respirator to be worn is an elastomeric respirator;

e. Understand the requirements for use in Appendix D of the OSHA Respiratory Protection Standard, 29 CFR 1910.134, and sign a copy of Appendix D as acknowledgement;

f. Store and maintain respirators in a functional and sanitary condition; and

g. Inspect respirators before each use for worn, degraded, and malfunctioning parts, and take out of service those respirators that are damaged or not functional.

2. RESPIRATORY PROTECTION PROGRAM

The Respiratory Protection Program shall apply to each employee required to wear a respirator due to exposure to an airborne chemical substance at a level equaling or exceeding its action level, OEL, or as determined by the Safety Division IHO. GSFC contractors are required to administer a respiratory protection program for their personnel required to wear respirators based on exposure levels equaling or exceeding an action level or OEL.

Respiratory protection program elements shall include:
a. Procedures for selecting respirators for use in the workplace;
b. Medical evaluations of employees required to use respirators;
c. Fit testing procedures for tight-fitting respirators;
d. Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;

e. Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;
f. Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere -supplying respirators;
g. Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
h. Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and
i. Procedures for regularly evaluating the effectiveness of the program.

2.1 Respiratory Protection Methods

2.1.1 Engineering Controls

a. Chemicals, equipment and materials to be selected for purchase or to be used in a process shall be those which minimize exposure to breathing air hazards;

b. Feasible engineering controls shall be implemented when personnel are subjected to airborne chemical hazards exceeding OELs;

c. Feasible engineering controls that do not reduce exposure below the OEL shall nonetheless be implemented to minimize exposure to hazardous airborne contaminant levels. If engineering controls fail to reduce contaminant levels to acceptable levels, administrative controls and respirators will be used in that order; and

d. Engineering controls should be utilized to reduce exposure to airborne chemical substances when potential exposures approach, but do not exceed, OELs.

2.1.2 Administrative Controls

a. Feasible administrative controls, including work practice controls, shall be utilized if engineering controls fail to reduce airborne chemical contaminant levels to below the action level or OELs; and

b. If engineering controls and respirators are not sufficient to reduce airborne contaminant concentrations to below the action level or OELs, the duration of time spent exposed to the hazard shall be limited, so as not to exceed the OELs.

2.1.3 Respirators

a. Respirators shall be worn to prevent over exposure to airborne contaminants or hazardous atmospheres until engineering or administrative controls can be implemented, or if engineering and administrative controls are not feasible or fail to reduce concentration levels to below the action level or OELs;

b. If the level of exposure cannot be identified or reasonably estimated, the atmosphere shall be considered IDLH;

c. Respirators shall be worn by personnel who have potential exposure to airborne contaminant levels equaling or exceeding the action level or OELs;

d. Respirators shall reduce personnel exposure to airborne contaminant levels to below the action level or OELs; and

e. Fit-testing and training for personnel who have SCBAs will normally be arranged through a source separate from the Safety Division.

2.2 Respirator Selection and Use

a. Respirators for civil service employees and contract personnel shall be provided by their respective employer;

b. Only respirators, filters, and cartridges certified by NIOSH as referenced in 42 CFR 84 shall be used;

c. Respirators shall be used only for the purpose intended and in compliance with their certifications;

d. Respirators with tight fitting facepieces shall not be worn by personnel who have facial hair or any condition that interferes with the face-to-facepiece seal or valve function;

e. Respirators shall be selected based on the following criteria:
   (1) Toxic substances and atmospheric hazards present;
   (2) Duration of respirator use;
   (3) Expected concentrations of air contaminants.

f. For protection against gases and vapors, the following respirator types may be used:
   (1) Air-purifying respirator, provided that the protection factor reduces the air contaminant concentrations to below the OEL, and that the cartridges are appropriate to protect against the contaminants of concern, and within their useful life (e.g., 8 hours of cumulative use, within the end-of-service-life indicator, or after each incident response requiring decontamination);
   (2) Atmosphere-supplying respirator, provided that the protection factor reduces the air contaminant concentrations to below the OEL.

g. For protection against aerosols (particulates), the following respirators may be used:
   (1) Air-purifying respirator, provided that the protection factor reduces the air contaminant concentrations to below the OEL, and equipped with an appropriately rated filter (N, R, P and 95, 99, 100);
   (2) Atmosphere-supplying respirator, provided that the protection factor reduces the air contaminant concentrations to below the OEL.

h. Filters, cartridges and canisters shall be labeled and color-coded according to ANSI Z88.7-2010 with the NIOSH approval label;

i. A seal check shall be performed each time a tight-fitting respirator is put on using the procedures in OSHA 29 CFR 1910.134 Appendix B-1;

j. Personnel using respirators shall cease operations and leave the area if they detect the odor of a contaminant, experience difficulty breathing, or discover the respirator is compromised; and not begin operations again until the respirator integrity, fit, airflow, or replacement of cartridges has been accomplished, and until any physical symptoms have been evaluated by a licensed health care practitioner at the Health Unit or private health care provider;

k. Air-purifying respirators shall be prohibited in the following situations or areas:
   (1) Atmospheres with chemical contaminant concentrations that are greater than the respirator's protection factor multiplied by the action level or OEL;
   (2) IDLH atmospheres;
   (3) Confined spaces, tanks, voids, or other areas that may have an oxygen-deficient atmosphere (less than 19.5% oxygen concentration) or that have not been fully evaluated for hazardous air contaminant concentrations;
   (4) Emergency response situations in which the atmosphere has not been evaluated and/or ventilated to safe conditions.

l. The calculation of maximum use concentration shall be conducted in accordance with the assigned protection factor table in OSHA 29 CFR 1910.134;

m. Full-face respirators shall be preferred when the user is exposed to splash hazards or eye irritants;

n. Only full facepiece pressure demand SCBAs or combination full facepiece pressure demand SARs with auxiliary self-contained air supply shall be used for IDLH atmospheres;

o. SCBAs intended for use in IDLH atmospheres shall be rated for at least 30 minutes;

p. SARs shall not exceed a maximum hose length of 300 feet; and

q. Escape-only respirators shall only be used for escape purposes, such as an IDLH atmosphere.

2.3 Respirator Maintenance and Care

a. Respirators shall be in good working order, and cleaned and disinfected using the procedures in OSHA 29 CFR 1910.134 Appendix B-2;

b. Respirators used by more than one individual shall be cleaned and disinfected after each use;

c. Respirators shall be stored in a sanitary condition to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals, such as in their original plastic bags or other sealable plastic bag or container;

d. Respirators shall be stored in such a way that the shape and fit of the face piece and other parts are not compromised to impair function;

e. Respirators shall be inspected for the following defects prior to use;
(1) Excessive dirt;
(2) Cracks, tears, deterioration;
(3) Distortion;
(4) Loss of elasticity;
(5) Scratched or incorrectly mounted lenses;
(6) Inflexible, degraded, torn, or poorly seated inhalation and exhalation valves;
(7) Broken straps or inelasticity;
(8) Cracks in the corrugated breathing tube (for air-supplied respirators);
(9) Accumulation of dirt, oil, tears in system components (for air-supplied respirators);
(10) Holes or deterioration in the hood.

f. Respirators shall not be used if they have been damaged, altered, or modified in any way that adversely affects their ability to protect personnel from airborne contaminants or hazardous atmospheres; and

g. Atmosphere supplying respirators, including SCBAs and emergency escape respirators, shall be maintained at a minimum of 90% service life and be inspected monthly by the user for all items in this section according to manufacturer's recommendations. A log will be maintained by the owner to document these inspections.

2.4 Medical Evaluation

a. Medical surveillance performed in accordance with NPR 1800.1 and 29 CFR 1910.134 shall be provided to each civil service employee enrolled in the Respiratory Protection Program. Contract personnel enrolled in their respective organizations' respiratory protection programs are required to receive medical surveillance from their organization. Medical surveillance will also be conducted in accordance with ANSI Z88.6-2006 and ATS/ERS Standardization of Lung Function Testing;

b. Medical evaluation shall include a baseline lung function test upon initial enrollment or within 30 days of enrollment;

c. Periodic medical evaluation may include a lung function test;

d. Medical evaluation of civil service employees at the GSFC Health Unit (Greenbelt or WFF) shall include a chemical exposure history at GSFC, a respirator use history, and a history of other possible

occupational or non-occupational exposures to airborne contaminants that may lead to respiratory illness;

e. If there is a medical condition that may place the employee's health at increased risk if a negative pressure respirator is used, a powered air purifying respirator (PAPR) shall be recommended if the medical evaluation finds that the employee can use such a respirator;

f. Personnel who suffer from respiratory diseases shall not perform operations necessitating the use of a respirator until the condition has abated;

g. Civil service employees enrolled in the Respiratory Protection Program shall receive an exit medical clearance prior to termination of employment at GSFC. A medical evaluation, if completed within 6 months of the termination, transfer, or retirement date, may be substituted for the exit medical clearance; and

h. Lung function testing equipment shall be in working order and properly calibrated.

2.5. Fit-Testing

a. Respirator fit-testing conducted in accordance with 29 CFR 1910.134 and ANSI Z88.10-2001 shall be accomplished for each civil service and contract employee enrolled in their respective organizations' respiratory protection program and uses a negative or positive pressure tight-fitting facepiece;

b. Fit-testing, either qualitative or quantitative, shall be accomplished for the same make, model, style, and size of respirator that will be used;

c. Fit-testing shall be accomplished prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually thereafter; and

d. Additional fit testing shall be accomplished whenever there are changes in the employee's physical condition that could affect respirator fit (e.g. dental changes, cosmetic surgery, and body weight).

2.6. Training

Civil service employees and contract personnel enrolled in respiratory protection programs shall receive initial and annual training from their respective employers. Civil service employees receive training from the Safety Division IHO. Training shall include the following:

a. An overview of 29 CFR 1910.134, NPR 1800.1, and this GPR;

b. Situations in which the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

c. Limitations and capabilities of the respirator;

d. Effective respirator use in emergency situations, and situations in which the respirator malfunctions;

e. Procedures to don and check the face-to-facepiece seal of the respirator;

f. Inspection, maintenance, and storage procedures; and

g. Recognition of medical signs and symptoms that may limit or prevent the effective use of respirators.

2.7. Voluntary Use of Respirators in Nonhazardous Atmospheres

a. Respirators may be worn by personnel without adherence to all aspects of this Program if such respirator use will not in itself create a hazard, and if airborne contaminant concentrations are less than the action level and OELs. This voluntary use of respirators by civil service employees shall only be authorized by the IHO. Voluntary use of respirators by contract personnel is required to be authorized and documented by their employer;

b. GSFC is not required to provide respirators for voluntary use;

c. Personnel who wear respirators voluntarily shall be medically able to wear a respirator as determined by the GSFC Health Unit or other licensed health care practitioner;

d. Voluntary users of respirators shall be provided with the information contained in Appendix D of the OSHA Respiratory Protection Standard, 29 CFR 1910.134, "Information for Employees Using Respirators When Not Required Under the Standard";

e. Civil service employees who wear respirators voluntarily shall sign, along with the supervisor, a voluntary use agreement (Form 350-PPE-0001, Respirator Voluntary Use Agreement), a copy of Appendix D of the OSHA Respiratory Protection Standard, 29 CFR 1910.134, and provide the signed copies to the IHO;

f. Personnel who wear respirators voluntarily shall ensure that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user; and

g. Personnel whose only use of respirators involves the voluntary use of filtering facepiece respirators (dust mask type) shall not be required to undergo medical evaluation to determine whether they are medically able to wear a filtering facepiece respirator.

2.8. IDLH Atmospheres

a. Personnel shall comply with GPR 8710.2 (Greenbelt) or GPR 8715.6 (WFF) for emergencies, as determined by the Safety Division or WFF Fire Department, that may require entry into an IDLH atmosphere;

b. GSFC personnel shall comply with OSHA 29 CFR 1910.134 Procedures for IDLH Atmospheres if attempting to enter an IDLH atmosphere, and shall use pressure demand SCBAs or other positive pressure SAR with auxiliary SCBA; and appropriate emergency retrieval devices and/or provisions;

c. Personnel entering an IDLH atmosphere and those providing support outside the IDLH atmosphere shall be trained and equipped to provide effective emergency rescue; and

d. At least one individual, or "buddy," shall be located outside the IDLH atmosphere, and maintain communication with the individual in the IDLH atmosphere.

2.9. Breathing Air Quality and Use

a. Compressed breathing air for atmosphere-supplying respirators (SARs and SCBAs) shall meet the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-2011, to include:

(1) Oxygen content of 19.5% to 23.5%;
(2) Hydrocarbon content of 5 milligrams per cubic meter of air or less;
(3) Carbon monoxide content of 10 parts per million (ppm) or less;
(4) Carbon dioxide content of 1,000 ppm or less; and
(5) Lack of noticeable odor.

b. Cylinders used to supply breathing air shall be in accordance with the following:

(1) Testing and maintenance as prescribed in Department of Transportation 49 CFR 173 and 178;
(2) Certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and
(3) Moisture content in the cylinder does not exceed a dew point of -50°F (-45.6°C) at 1 atmosphere pressure.

c. Compressors used to supply breathing air to respirators shall be constructed and situated so as to prevent contaminated air from entering the breathing air system, minimize moisture content so that the dew point at 1 atmosphere pressure is 10°F (5.56°C) below the ambient temperature, have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality, have a tag indicating the most recent change date and signature of the person who performed the change, and be tested in accordance with the more stringent of ANSI/Compressed Gas Association G-7.1-2011 or manufacturer's recommendation;

d. For oil-lubricated compressors, a high-temperature or carbon monoxide alarm, or both, shall be used to monitor carbon monoxide levels;

e. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm;

f. Breathing air couplings shall be incompatible with outlets for non-respirable worksite air or other gas systems;

g. No asphyxiating substance shall be introduced into breathing air lines; and

h. Breathing gas containers shall be marked in accordance with the NIOSH respirator certification standard, 42 CFR 84.

Appendix A – Definitions

See OSHA 29 CFR 1910.134 for definitions required for this directive, unless otherwise defined below.

A.1 **Action level** – The exposure level for a specific chemical substance at which a respirator shall be worn if an individual intends to perform work duties. The action level is generally an 8-hour time-weighted average (TWA) exposure, one-half the OSHA permissible exposure limit (PEL) or as specified by NASA, OSHA, ACGIH, NIOSH, or other recognized standard setting organization.

A.2 **Administrative control** – Method of controlling employee exposures by job rotation, work assignment, scheduling, or time periods away from the hazard.

A.3 **Air-purifying respirator** – A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element (includes negative pressure and positive pressure powered air purifying respirators (PAPRs).

A.4 **Atmosphere-supplying respirator** – A respirator that supplies breathing air from a source independent of the atmosphere in which the respirator wearer is working. It includes self-contained breathing apparatus (SCBA) units and supplied-air respirators (SARs).

A.5 **Baseline lung function test –** A lung function test against which future lung function tests are compared.

A.6. **Emergency situation** – Any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

A.7 **Engineering control –** Method of controlling employee exposure by modifying the source or reducing the contaminant concentration. Examples of engineering controls include substitution of materials, enclosures, isolation of personnel, exhaust ventilation, or other designs that reduce the airborne concentration at the source of generation or along the path from the point of generation to the individual. This does not include protective equipment such as respirators or administrative controls.

A.8 **Escape-only respirator** – A respirator intended to be used only for emergency exit.

A.9 **Filtering facepiece (dust mask) respirator** – A negative pressure respirator with a filter as an integral part of the facepiece, or with the entire facepiece composed of the filtering medium.

A.10 **Fit test** – A protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. A qualitative fit test is a pass/fail test that relies on the individual's response to a test agent. A quantitative fit test is a numerical measurement of the amount of leakage into the respirator.

A.11 **High-efficiency particulate air (HEPA) filter** – A filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. Filters approved by NIOSH 42 CFR 84 for respirators are annotated N100, R100, and P100.

A.12 **Immediately dangerous to life and health (IDLH)** – An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

A.13 **Negative pressure respirator (tight fitting)** – A respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

A.14 **Occupational exposure limit (OEL) –** The exposure limit for a given chemical substance permitted or recommended by GSFC, NASA, OSHA, ACGIH, NIOSH, or other recognized authority (e.g., OSHA permissible exposure limits (PELs), ACGIH threshold limit values (TLVs®), OSHA ceiling limits, ACGIH short-term exposure limits (STELs), NIOSH recommended exposure limits (RELs)).

A.15 **Oxygen deficient atmosphere** – An atmosphere with an oxygen content below 19.5% by volume.

A.16 **Permissible exposure limit (PEL)** – The airborne concentration of a substance that a worker may be exposed to under OSHA regulations, 29 CFR 1910.1000. OSHA PELs are based on an 8-hour time-weighted average (TWA) exposure.

A.17 **Positive pressure respirator** – A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

A.18 **Powered air-purifying respirator (PAPR)** – An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

A.19 **Protection factor** – The level of respiratory protection that a respirator is expected to provide.

A.20 **Respirator** – Device approved by NIOSH to reduce the wearer's exposure level to airborne contaminants or for protection in an oxygen-deficient or IDLH atmosphere.

A.21 **Respiratory protection program** – Program that prevents workplace exposure to airborne chemical substances or IDLH atmospheres. It includes requirements for exposure assessment, medical evaluation, fit-testing, respiratory protection methods, and training. The collective requirements in this GPR constitute the GSFC Respiratory Protection Program.

A.22 **Seal check –** An action conducted by the respirator user to determine if the respirator is properly seated to the face.

A.23 **Self-contained breathing apparatus (SCBA) –** An atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user as a breathing air tank.

A.24 **Short-term exposure limit (STEL) –** The airborne concentration of a substance that a worker may be exposed to as a 15-minute TWA.

A.25 **Supplied-air respirator (SAR) or airline respirator –** An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user; and

A.26 **Time-weighted average (TWA)** - Average over a specified time period.

Appendix B – Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
BEI®	Biological Exposure Index
CFR	Code of Federal Regulations
COR	Contracting Officer's Representative
FRC	Federal Records Center
GPR	Goddard Procedural Requirements
HEPA	High Efficiency Particulate Air
IDLH	Immediately Dangerous to Life and Health
IH	Industrial Hygiene
IHO	Industrial Hygiene Office
MEMD	Medical and Environmental Management Division
NIOSH	National Institute of Occupational Safety and Health
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
NPRC	National Personnel Records Center
NRRS	NASA Records Retention Schedules
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PAPR	Powered Air Purifying Respirator
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
PPM	Parts per Million
REL	Recommended Exposure Limit
SAR	Supplied Air Respirator
SCBA	Self-Contained Breathing Apparatus
STEL	Short-Term Exposure Limit
TLV®	Threshold Limit Value
TWA	Time-Weighted Average
WFF	Wallops Flight Facility

CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline	03/27/2009	Initial Release
A	11/10/2010	Administratively Revised to update the Responsible Office Code, Organization Title and organization name within the document.
B	03/23/2015	Revised format, terms, and responsibilities. Changes to Applicable Documents and Records, updated the Responsible Office Title and Code.